

Two new species of *Arge* Schrank (Hymenoptera: Argidae) from China

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Abstract: The diagnostic characters of *Arge nippensis* group and *Arge mali* group are briefly discussed. Two new species of Argidae are described from China: *Arge wanziae* Wei sp. nov. and *Arge listoni* Wei sp. nov. *Arge wanziae* is a member of the *Arge nippensis* group and *A. listoni* is a member of *Arge mali* group.

Key words: Symphyta; Arginae; sawflies; taxonomy

中国三节叶蜂属二新种（膜翅目：三节叶蜂科）

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摘要: 简要讨论了 *Arge nippensis* group 和 *Arge mali* group 的鉴别特征, 记述中国三节叶蜂科 2 新种: 截斑黄腹三节叶蜂 *Arge wanziae* Wei sp. nov. 和高域环腹三节叶蜂 *Arge listoni* Wei sp. nov., 前者属于 *Arge nippensis* 种团, 后者属于 *Arge mali* 种团。

关键词: 广腰亚目; 三节叶蜂亚科; 叶蜂; 分类

Introduction

Argidae is the second largest family of the paraphyletic suborder Symphyta of Hymenoptera with more than 950 valid species in the world. Within China, about 171 species and 16 genera have been recorded (Du *et al.*, 2018). Eastern Asia is one of three main centers of diversity of Argidae (Wei & Nie 1997). It is likely that many more species of Argidae will be found in eastern Asia in the future.

Here we report two additional new species of *Arge* Schrank from China.

Material and methods

Insect specimens were examined using a Leica S8APO dissecting microscope. Detailed images of adults were taken with a Leica Z16 APO/DFC550 and were then montaged using Helicon Focus (©HeliconSoft). Montaged images were further processed using Adobe Photoshop CS 6.0.

The terminology used for sawfly genitalia follows Ross (1945), whereas the terminology for general morphology follows Niu & Wei (2010). Abbreviations are as follows: OOL —

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distance between the eye and outer edge of lateral ocelli; POL — distance between the mesal edges of lateral ocelli; and OCL — distance between the lateral ocellus and the occipital carina or hind margin of the head.

Specimens examined during this study are deposited in the Asian Sawfly Collection, Nanchang, China (ASC).

Taxonomy

Arge nipponensis group and *Arge mali* group

Species of *Arge nipponensis* group share following characters: supraclypeal area convex with a distinct middle carina (except for *A. pseudopagana* Wei, 2010); ovipositor sheath broad and convex in dorsal view, distinctly and roundly narrowed toward apex; in lateral view ovipositor sheath shorter than hind femur and distinctly concaved near base; lancet without stout and lobe-like annular spurs, distance between first and second serrulae clearly longer than distance between second and third serrulae; penis valve with a short or long ventral apical process, without dorsal apical process; head and thorax black, usually with distinct bluish tinge; abdomen largely or entirely yellow brown; pterostigma and vein C black or blackish brown; legs usually black or blackish brown, sometimes hind leg partly yellow brown.

Arge nipponensis group is a small group among the Asian species of *Arge*, and 11 species have been described.

Species of *Arge mali* group share following characters: body black to black brown, abdomen with one or several middle segments yellow white; hind leg usually black with tibia partly white; anterior margin of clypeus distinctly incised; antenna longer than head breadth; ovipositor sheath broad and convex in dorsal view, distinctly and roundly narrowed toward apex; in lateral view ovipositor sheath shorter than hind femur and distinctly concaved near base; lancet evenly narrowed toward apex, without stout and lobe-like annular spurs, distance between first and second serrulae clearly longer than distance between second and third serrulae; valviceps of penis valve broad, with a short ventral apical lobe and a short and broad caudal lobe, without dorsal apical process; wings hyaline, pterostigma and vein C black or blackish brown, a small smoky macula present just below pterostigma, never extending beyond middle of pterostigma.

Arge mali group includes 8 east Palaearctic species. Six of them have been recorded from China.

1. *Arge wanziae* Wei sp. nov. (Fig. 1)

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Female. Length 7.5 mm (Fig. 1A). Body including legs and sheath black with strong blue reflection, antenna black and dim, without blue tinge (Fig. 1B); abdominal segments 2–8 entirely yellow brown. Body hairs silver, setae on sheath brown. Basal 2/3 of fore wing strongly infumated, apical 1/3 hyaline, boundary between them distinct; basal 3/5 of hind wing weakly infuscate, apical 2/5 hyaline; pterostigma and veins within smoky part black, veins within hyaline part pale brown (Fig. 1A).

Basal half of labrum shallowly and sparsely punctured, post orbit, temple and postocellar area minutely and sparsely punctured, basin of frontal area almost smooth, other parts of head

densely punctured; pronotum faintly punctured, mesonotum with minute and sparse punctures; mesepisternum with minute setigerous punctures, anepimeron densely punctured, metapleuron and abdominal tergites smooth, posterior margin of tergite 1, tergites 9 and 10 largely, and ovipositor sheath feebly microsculptured.

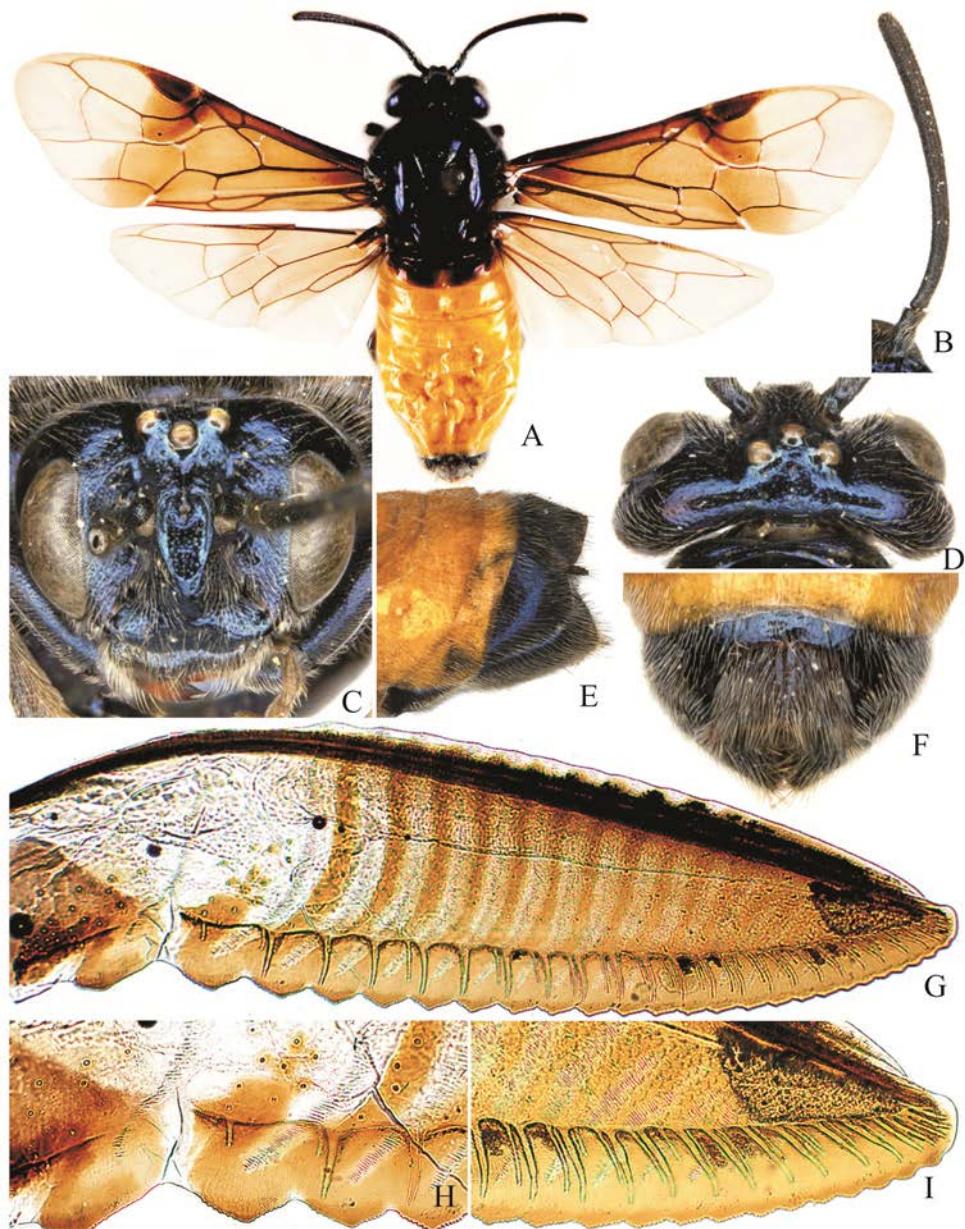


Figure 1. *Arge waniziae* Wei sp. nov. A. Adult, dorsal view; B. Antenna; C. Head, frontal view; D. Head, dorsal view; E. Apex of abdomen and ovipositor sheath, lateral view; F. Apex of abdomen and ovipositor sheath, dorsal view; G. Lance; H. Basal 4 serrulae; I. Apical serrulae.

Body hairs on dorsum of head, thorax and abdomen slightly shorter than diameter of median ocellus. Anterior margin of clypeus very shallow and roundish (Fig. 1C); malar space 0.8 times as long as diameter of lateral ocellus and almost as long as diameter of median ocellus; supraclypeal area distinctly elevated, without distinct middle carina; middle fovea deep, shallowly open to frontal basin; lateral carinae sharp, strongly convergent downwards, merged at middle of supraclypeal area; frons elevated, middle basin shallow; inner margins of eyes slightly convergent downwards, distance between eyes 1.15 times as long as longest axis of eye; POL : OOL : OCL = 17 : 23 : 13; lateral ocelli at line of posterior margin of eyes; interocellar furrow absent, postocellar furrow obscure; postocellar area about 2 times as broad as long, posterior part strongly oblique, lateral furrows indistinct; in dorsal view head distinctly enlarged behind eyes, temple about 0.8 times as long as eye (Fig. 1D). Antenna slender, as long as thorax, pedicellum as long as broad, flagellum slightly bent near base, hardly compressed or enlarged toward apex (Fig. 1B). Middle and hind tibia each with a preapical spur; metabasitarsus slightly longer than following 3 tarsomeres combined. Fore wing: vein R+M 0.5 times as long as free part of Sc, third abscissa of Rs 2.5 times the length of fourth abscissa, 1r-m straight, 3r-m bent outwards at upper third, cell 2Rs longer than 1Rs, upper margin of cell 2Rs 1.05 times as long as lower margin, cu-a meeting cell 1M beyond middle. Hind wing: length ratio of cell A, petiole of cell A and cu-a as 53 : 38 : 15. Ovipositor sheath slightly shorter than hind femur in lateral view, distinctly bent in basal third (Fig. 1E); sheath in dorsal view as Fig. 1F, each lobe subtriangular, apex slightly protruding; lancet simple with 25 serrulae, without lobe-like annular spine, annular spine bands very narrow (Fig. 1G); basal serrulae strongly and triangularly convex (Figs. 1G, H), apical serrulae weakly oblique (Fig. 1I), subbasal teeth minute (Fig. 1H), distance between serrulae 1 and 2 much longer than distance between serrulae 2 and 3 (Figs. 1G, H).

Holotype. ♀, **China**, Hunan, Mt. Mufu, Gouli, 113°49.711'E, 28°57.939'N, alt. 860 m, IV-26-2007, Zejian LI leg. **Paratypes.** 1♀, **China**, Hunan, Mt. Mufu, Gouli, 113°49.711'E, 28°57.939'N, alt. 860 m, 24-IV-2008, Zejian LI leg.; 1♀, **China**, Hunan, Mt. Mufu, Yunteng Shanzhuang, 113°49.129'E, 28°58.236'N, alt. 1100 m, 06-V-2008, Fu ZHAO leg; 2♀, **China**, Zhejiang, Lin'an, Mt. Tianmu, Kaishanlaodian, 119.433'E, 30.323'N, alt. 1106 m, 28–29-IV-2017, Zejian LI, Mengmeng LIU, Kaiwen GAO & Tingting JI leg.

Male. Unknown.

Etymology. This new species is named after the nickname of the corresponding author's student, Yuan ZHANG, who finished the first investigation of the sawfly fauna in Mt. Mufu, Hunan Province.

Distribution: China (Zhejiang, Hunan).

Remarks. This new species is quite similar to *Arge aurora* Wei, 2020 in body and wing color but differs from it by the apical 2 segments of abdomen and sheath entirely black, the supraclypeal area without a sharp middle carina, the legs entirely blue black, the female lancet with 25 serrulae and the basal serrulae strongly and triangularly convex.

2. *Arge listoni* Wei sp. nov. (Fig. 2)

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Female. Body length 8–9 mm (Fig. 2A). Body black, shiny, head and thorax with faint metallic bronze tinge (Figs. 2B, C), antennal flagellum dark reddish brown (Fig. 2E),

abdominal segment 2 entirely, segment 3 largely or entirely yellow brown (Fig. 2A); legs black, fore tibia brown, basal 0.8 of middle tibia and basal 0.6 of hind tibia yellow white. Body hairs silver, hairs on flagellum and sheath black brown. Wings feebly infuscate, pterostigma and veins largely black brown, fore wing with a weak and narrow infumated stripe under pterostigma (Fig. 2A).

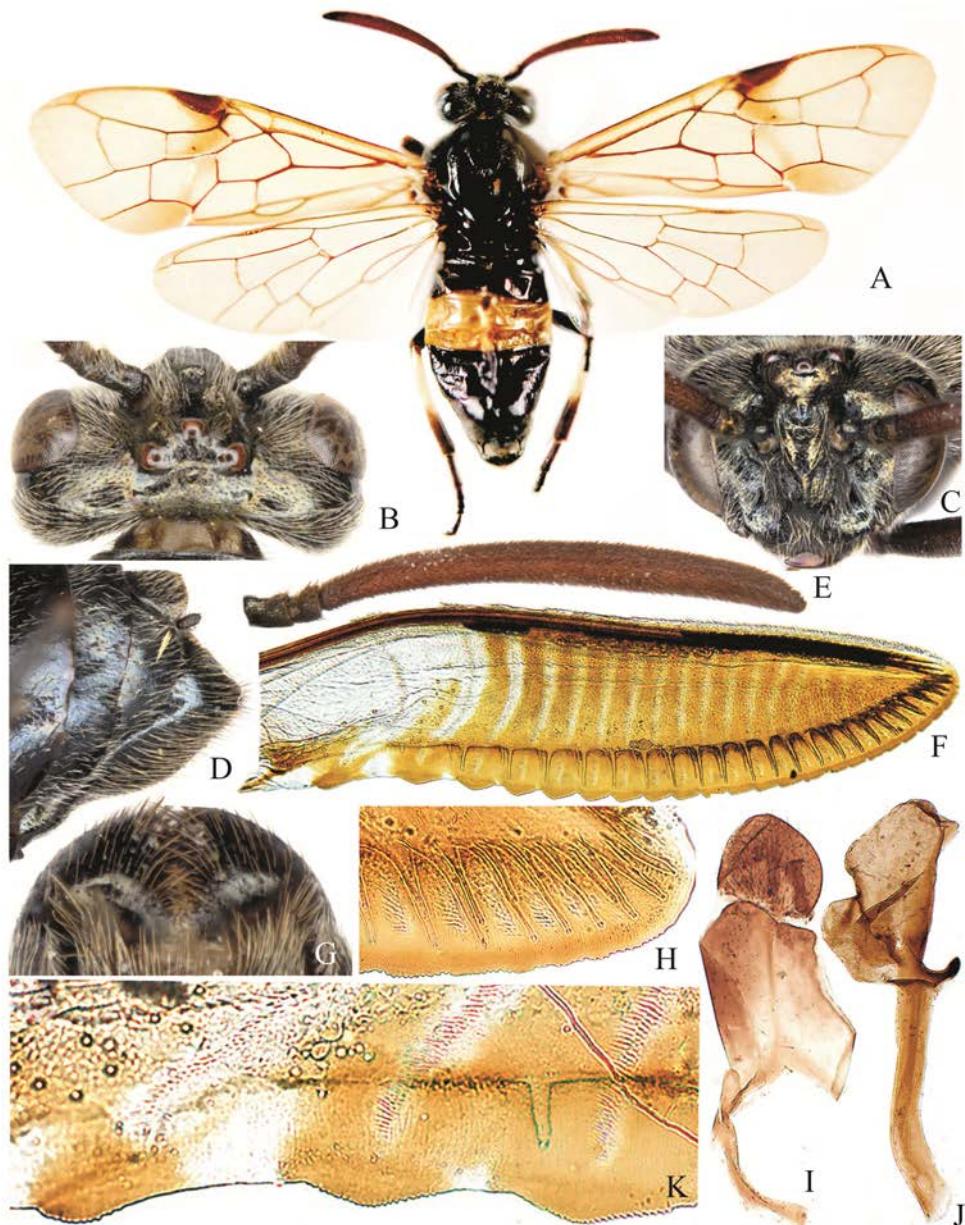


Figure 2. *Arge listoni* Wei sp. nov. A. Adult, dorsal view; B. Head, dorsal view; C. Head, frontal view; D. Apex of abdomen and ovipositor sheath, lateral view; E. Antenna; F. Lancet; G. Apex of abdomen and ovipositor sheath, dorsal view; H. Apical serrulae; I. Harpe and gonostipe; J. Penis valve; K. Basal 3 serrulae.

Clypeus and supraclypeal area densely punctured, frons smooth and strongly shiny, post orbit, temple and postocellar area minutely and sparsely punctured (Figs. 2B, C); pronotum with minute punctures; mesonotum faintly and sparsely punctured, mesopleuron and abdominal tergites smooth, strongly shiny.

Hairs on dorsum of head slightly shorter than diameter of lateral ocellus, hairs on mesonotum as long as radius of lateral ocellus, and on mesopleuron as long as diameter of lateral ocellus. Anterior incision of clypeus deep and round, middle depth about half the length of clypeus; malar space as long as median ocellus; inner margins of eyes slightly convergent downward, distance between eyes almost as long as longest axis of eye; supraclypeal area strongly elevated, with a low but distinct middle carina, middle fovea connected with frontal basin; lateral carinae between toruli low and obtuse, strongly convergent downward and meeting at middle of face (Fig. 2C); frons expanded toward ocelli, frontal basin distinct; interocellar furrow absent, postocellar furrow shallow; OOL : POL : OCL = 28 : 21 : 19; postocellar area strongly declined backward, about 3 times as broad as long, lateral furrows fine and shallow, weakly convergent backward; in dorsal view head slightly and roundly narrowed behind eyes (Fig. 2B), temple about half length of eye. Antenna stout, hardly bent, as long as thorax, pedicellum broader than long, flagellum with low and obtuse longitudinal carina, apex narrowly round (Fig. 2E). Mesoscutellum flat, distance between cenchri 0.3 times as long as longest axis of a cenchrus. Middle and hind tibia each with a pre-apical spur, metabasitarsus slightly longer than following 3 tarsomeres combined. Fore wing: free part of vein Sc erect and just at base of R+M, R+M 0.4 times as long as 1r-m, cell 1Rs clearly shorter than 2Rs, cell 2Rs shorter than cells 1R₁+1Rs, upper margin of 2Rs 1.1 times as long as lower margin, vein 3r-m weakly bent outward at upper third, third abscissa of vein Rs about 2.5–2.8 times as long as fourth abscissa of vein Rs, cu-a meeting cell 1M basad middle, basal anal cell closed. Hind wing: cell Rs 1.5 times as long as M, length ratio of anal cell, anal petiole and cu-a as 55 : 31 : 12. Posterior margin of abdominal sternite straight with a small middle process; ovipositor sheath slightly shorter than hind femur, distinctly bent at basal third, ventral margin of apical 0.7 roundish (Fig. 2D); in dorsal view sheath broad and round, not acutely protruding at apex (Fig. 2G).

Male. Body length 6.5 mm. Color and structure similar to female except for: abdomen entirely blue black, head and thorax without brown tinge; flagellum with erect hairs about 0.7 times the breadth of flagellum; middle carina on face high, middle fovea long and with a low but distinct upper wall, frons as long as broad; face and clypeus sparsely punctured; subgenital plate broader than long, apical margin truncate; harpe broader than long and round at apex (Fig. 2I); valviceps of penis valve broad with a short anterior process, a very broad caudal lobe and a narrow lateral lobe (Fig. 2J).

Holotype. ♀, **China**, Henan, Dengfeng, Mt. Shaoshi, 09-VI-2000, Yihai ZHONG leg. **Paratypes.** 14♀1♂, **China**, Henan, Dengfeng, Mt. Shaoshi, 09-VI-2000, Meicai WEI, Mingli CHEN, Yihai ZHONG leg.; 1♀, **China**, Gansu, Huixian, Mayan Forest Plant, 04-VI-2007, Haiyan MA leg.; 1♀, **China**, Shaanxi, Feng County, IV-1982; 1♀, **China**, Sichuan [Chongqing], Wanxian, 29-V-1994; 3♀, **China**, Shandong, Qingdao, Mt. Laoshan, alt. 500–1000 m, 07-VIII-2003, Shouzhu LIU leg.; 3♀, **China**, Shandong, Qingdao, Mt. Laoshan, alt. 500–1000 m, 23-V-2004, Weixing LIU leg.; 1♀, **China**, Hunan, Yongzhou, Mt. Yangming, alt. 900–1000 m, 25-IV-2004, Shouzhu LIU leg.; 1♀, **China**, Hunan, Mt. Mufu, Gouli,

28°57.939'N, 113°49.711'E, alt. 860 m, 26-IV-2007, Fei LIU leg.; 1♀, **China**, Hunan, Mt. Mufu, Yunteng Shanzhuang, 113°49.129'E, 28°58.236'N, alt. 1100 m, 20-V-2008, Yuan ZHANG leg.; 1♀, **China**, Hubei, Mt. Shennongjia, Xiaozhai, Xibian, 31°33.870'N, 110°08.121'E, alt. 940 m, 25-V-2008, Fu ZHAO leg.; 1♂, **China**, Hubei, Xianfeng, Mahaba, alt. 450 m, 25-VII-1999, Wenjun BU leg.; 1♀, **China**, Zhejiang, Lin'an, Mt. Tianmu, Laodian, 30.343'N, 119.433'E, alt. 1106 m, 05-V-2017, Mengmeng LIU, Kaiwen GAO & Tingting JI leg.; 1♀, **China**, Zhejiang, Lin'an, Mt. Tianmu, Xianrending, 30.349'N, 119.424'E, alt. 1506 m, 27-V-2017, Zejian LI, Mengmeng LIU, Kaiwen GAO & Tingting JI leg.

Etymology. This species is named after Mr. Andrew LISTON, a sawfly taxonomist.

Distribution: China (Gansu, Shaanxi, Henan, Shandong, Hubei, Zhejiang, Hunan, Chongqing).

Remarks. This new species is quite similar to *Arge mali* (Uchiyama, 1906) from Japan in body color and general appearance, but differs clearly from it by the structure of lancet and penis valve: the female lancet narrow, total length of serrulae about 3.6–3.7 (3–3.2 in *A. mali*) times the breadth of lancet at middle; the area enclosed by pore lines quite narrow, the height of the 10th annulus about 3.3–3.4 (4–4.2 in *A. mali*) times the height of the area enclosed by the pore lines; the height of the area enclosed by the pore line of the 10th annulus about 2.5 (1.8 in *A. mali*) times the breadth of the area; the shape of the valviceps of penis valve quite different in the two species (cf. Fig. 32, Togashi 1992).

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